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Work-Family Interference, Psychological Distress, and Workplace Injuries

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Abstract

We draw on Conservation of Resources theory (Hobfoll, 1989) to investigate in two studies the relationship between work-family interference (i.e., work-family conflict and family-work conflict) and workplace injuries as mediated by psychological distress. In Study 1, we use split survey data from a sample of UK healthcare workers (N = 645) to first establish the model, and then cross-validate it, finding that work-family conflict (but not family-work conflict) was related to workplace injuries via psychological distress. In Study 2, we extend the model with a separate two-wave sample of manufacturing and service employees (Study 2; N = 128). We found that psychological distress mediated the relationship between work-family conflict and workplace injuries 6 months later. The implications of making workplaces safer by enabling employees to better manage competing work and home demands are discussed.

Keywords: safety; stress; work-family interference; workplace injuries

Practitioner Points

- This research illustrates how the stress from managing work and family is related to more frequent workplace injuries.
- Reducing psychological distress – particularly from the conflict between balancing work and home domains – may be a way of keeping workers physically safe.

Work-Family Interference, Psychological Distress, and Workplace Injuries

According to the United States (US) Bureau of Labor Statistics (2012), the US workforce experienced approximately 3 million non-fatal workplace injuries and illnesses in 2011 (i.e., 3.5 cases per 100 equivalent full-time workers), with 4,693 workers fatally injured that year. Although it is the responsibility of organizations to provide a safe work environment for employees, these data demonstrate that many organizations fail to do so. As meta-analytic research has begun to show, psychosocial factors are important predictors of workplace injuries and safety behaviors (e.g., Clarke, 2010; 2012; Nahrgang, Morgeson, & Hofmann, 2011). For example, Clarke (2010) demonstrated that safety climate is related to safety behavior and workplace injuries through workplace attitudes. Similarly, Nahrgang et al. (2011) found that job demands and resources relate to a range of safety outcomes through burnout and engagement. Therefore, the examination of psychosocial determinants of workplace injuries and their mechanisms is important to the promotion of workplace safety.

Research examining the psychosocial determinants of workplace injuries has examined both hindrance and challenge stressors (see Clarke, 2012). Hindrance stressors impede personal growth by getting in the way of goal attainment, whereas challenge stressors promote growth by enhancing learning (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). As Clarke (2012) demonstrates, hindrance stressors (e.g., role conflict) are of particular concern in the domain of workplace safety because they are related to employee strain and may therefore interfere with important employee physical outcomes.

Drawing on conservation of resources theory (Hobfoll, 2001), we examine in this paper an underexplored hindrance stressor that threatens individual resources and may

ultimately relate to workplace injuries, namely work-family interference (i.e., work-family conflict and family-work conflict). Work-family interference is a form of inter-role conflict in which work conflicts with family (i.e., work-family conflict), and vice versa (i.e., family-work conflict) (Greenhaus & Beutell, 1985; Grzywacz & Demerouti, 2013). This concept is based on role stress theory (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964), which argues that if a given set of social roles impose conflicting role expectations on a focal person, it can create psychological conflict and role overload. This form of role conflict can also affect important resources, including time, energy, and commitment, which are finite, and can drain individuals leading to psychological strain. Ultimately, trying to conserve functioning in two salient life domains may threaten an individual's ability to meet demands in each domain, leading to psychological strain and potential failures in performance, such as workplace injuries.

This paper examines the relationship between work-family interference and workplace injuries, and whether these relationships are mediated by psychological distress. Specifically, drawing on conservation of resources theory (COR; Hobfoll 1989; 2001), we propose that greater levels of psychological distress - defined as a negative state of mental health characterized by anxiety and depressive symptoms (Selye, 1974) - arising from work-family and family-work conflict may be related to more frequent workplace injuries. The current research contributes to both the work-family interference and safety literatures by examining the psychological effects of work-family interference on workplace injuries.

Work-family Interference and Resource Loss

COR theory (Hobfoll, 1989; Hobfoll & Shirom, 2001) argues that "individuals strive to obtain, retain, protect, and foster things that they value" (Hobfoll, 2001, p. 341). COR theory builds on earlier stress theory (Lazarus, 1991, Lazarus & Folkman, 1987), by identifying a threat to resources, and the desire to protect resources as a key human motive. According to COR theory, resource loss is more salient than resource gain, and when individuals experience loss, they become more vulnerable to further loss. Since resources are of value, their loss or threat of loss leads to psychological stress. To offset the stress, individuals struggle to regain resources, and in doing so, may engage in behaviors that are counterproductive or self-defeating (Hobfoll, 1989).

Hobfoll (1989, 2001) argued that important resources include psychological characteristics, objects, energies, and conditions. In this study, we consider resources in the form of energies and conditions that are germane to family and work life. Some examples of family resources include a stable family life and marriage, intimacy with family members, time for family, and an enduring relationship with children (Hobfoll, 2001). Work resources include factors such as time for work, status at work, stable employment, and advancement at work (Hobfoll, 2001).

Unfortunately, valued resources are not always compatible. The demands of one domain (e.g., work or family) sometimes require the reallocation of resources that take an individual away from his/her other priorities (Shaffer, Harrison, Gilley, & Luk, 2001). Individuals have a limited amount of time in a day to meet both family and work demands. Work schedules, task deadlines, family commitments, sick children, and a partner's work schedule compete with one another and constrain the amount of time one has to meet obligations in each domain. These are forms of time-based work-family and

family-work conflict (Greenhaus & Beutell, 1985), which occur when the time required by one domain interferes with time required by another. Since both work and family represent salient and interdependent life domains, the threat to meet demands in each domain is likely to trigger psychological distress.

Further, COR theory suggests that those who lose resources are more vulnerable to further resource loss. To regain lost resources, individuals are required to invest more resources. This process may lead individuals to feel they are constantly trying to play "catch-up" as they work to offset their losses. When resources such as time diminish, efforts to prevent loss by working faster or cutting corners can become detrimental to psychological well-being and accomplishment in both domains.

As argued above, COR theory suggests that actual or threat of resource loss, such as loss that might arise from role conflict, is associated with psychological distress. A substantial body of research has demonstrated that role conflict more generally (e.g., Nixon, Mazzola, Bauer, Krueger, & Spector, 2011), and work-family interference in particular (e.g., Amstad, Meier, Fasel, Elfering, & Semmer, 2011; Frone, Russell, & Cooper, 1997; Major, Klein, & Ehrhart, 2002) affects the stress and well-being of employees (e.g., physical health, somatic symptoms, and psychological stress, strain, exhaustion, and depression). Based on these theoretical and empirical arguments, we propose that:

Hypothesis 1: Work-family conflict (H1a) and family-work conflict (H1b) will be related to psychological distress.

Psychological Distress as a Mediator of Work-Family Interference and Workplace Injuries

The present study examines the influence of work-family interference on workplace injuries, mediated by psychological distress. A workplace injury is a bodily wound that results from an event or a series of events within the workplace (Baker, O'Neill, Ginsburg, & Li, 1994). Such injuries are more likely to occur when individuals behave in unsafe ways, such as cutting corners, ignoring safety procedures, and working too quickly (Halbesleben, 2010).

To our knowledge, only Cullen and Hammer (2007) have examined how work-family interference (i.e., work-to-family conflict and family-to-work conflict) relates to workplace safety. That study finds that such interference lowers safety compliance (i.e., core safety behaviors necessary to maintain a safe environment; Neal, Griffin, & Hart, 2000) and safety participation (i.e., discretionary behaviors that contribute to safety; Neal et al., 2000) and, finding that family-to-work but not work-to-family conflict relate to safety behaviors. This result is surprising given the large body of meta-analytic research that suggests that work-to-family conflict is a significant source of stress for employees (Bellavia & Frone, 2005) and that both forms of inter-role conflict can have disruptive effects in both domains (e.g., Amstad et al., 2011; Michel, Mitchelson, Kotrba, LeBreton, & Baltes, 2009).

We build on Cullen and Hammer (2007) by drawing on COR theory to consider psychological stress as an explanatory mechanism between work-family interference and safety. As argued above, work-family interference is likely to lead to psychological distress. When individuals experience psychological distress resulting from resource loss or impending loss, they aim to both minimize loss and regain lost resources. Resource loss such as time loss due to work-family interference leads individuals to protect or

rebuild those resources. Hobfoll (2001) argued that individuals may engage in self-defeating behaviors in an effort to rebuild resources. Since time is finite, the only way to do this rebuild this resource is to speed up pace of work, take shortcuts, and multitask. As demonstrated by Cullen and Hammer (2007), this may also lead individuals to withhold discretionary and required safety behaviors. These self-defeating behaviors are associated with increased frequency of physical injury (Halbesleben, 2010).

Existing empirical research has shown that psychological distress is associated with a greater likelihood of experiencing workplace injuries. Among samples of health care workers (e.g., Guastello, Gershon, & Murphy, 1999), construction workers (e.g., Siu, Phillips, & Leung, 2004), and employed adults more generally (e.g., Tomás, Oliver, Cheyne, & Cox, 2002), higher levels of psychological distress were related to more frequent workplace injuries. Based on COR theory, we argue that higher levels of psychological distress related to the conflict between balancing work and non-work obligations results in increased likelihood of workplace injuries.

Hypothesis 2: Psychological distress will mediate the relationship between work-family (H2a) and family-work (H2b) conflict and workplace injuries.

Overview of Current Studies

We conducted two studies that used different research designs with employees from different occupational contexts to examine the hypothesized relationships between work-family interference, psychological distress, and workplace injuries. The first study used cross-sectional survey data from healthcare workers to calibrate and validate a model, and the second study used two-wave data from a sample of manufacturing and service employees to test the model in a range of occupational contexts.

Study 1

Procedure and Sample

We obtained data for this study from medical staff of a public hospital in northern England. We mailed surveys to staff through the internal mail system with a cover letter explaining the voluntary nature of the questionnaire and a postage-paid envelope for returning completed surveys.

Of the 1,344 questionnaires distributed, 645 usable surveys were returned (48% response rate). The sample, which included 519 women (80.5%), reported an average age of 43.74 years (SD = 10.58 years). Participants had a median of one dependent living at home. Respondents were employed predominantly in medical support positions: nurses (33%), doctors (8.5%), administrators (18.8%), lower-level managers (5.7%), professions allied to medicine (12.9%), laboratory personnel (8.4%), and ancillary staff (12.7%).

Measures

Work-family conflict. We used two items to capture work-family conflict. These items were to what extent "does your job interfere with responsibilities at home, such as cooking, child-care?" and "does your job keep you from spending the amount of time you would like to spend at home?". The response scale was 1 (never) to 5 (very often), with high scores indicating greater work-family conflict.

Family-work conflict. We used two items to capture family-work conflict. These items were to what extent "does home life interfere with work responsibilities, e.g. getting to work on time?" and "does home life keep you from spending amount of time you'd like to spend on job?". The response scale was 1 (never) to 5 (very often), with high scores indicating greater family-work conflict.

Psychological distress. This variable was measured using four items from the General Health Questionnaire (GHQ) (Goldberg, 1978). Participants were asked to identify how often (in the last few weeks) they had experienced various symptoms (e.g., feeling constantly under strain, difficulty overcoming problems, feeling unhappy and depressed). While the GHQ is most commonly used in the organizational literature in its 12-item form to measure context-free psychological strain (Mullarkey et al., 1999), large-sample analyses (e.g., Shevlin & Adamson, 2005) have suggested a 3-factor model (i.e., Anxiety-Depression, Social Dysfunction, and Loss of Confidence), with the items used in the current study constituting the Anxiety-Depression factor. The response scale was from 0 (not at all) to 3 (much more than usual), with higher scores indicating greater psychological distress.

Workplace injuries. Injuries were measured using a scale by Hemingway and Smith (1999). Participants were asked to indicate how frequently over the last four weeks they had sustained a range of nine categories of work-related injuries (burns or scalds; contusions or crushing bruises; scratches or abrasions; sprains or strains; concussion; cuts, lacerations, or punctures; fractures; hernia or ruptures; tendonitis) on an ordinal scale scored as 1 (never), 2 (once), 3 (2-3 times), 4 (4-5 times), and 5 (more than 5 times).

Control variables. We controlled for age (in years), gender (1 = male, 0 = female), number of dependents living at home, and eight occupational groups (i.e., seven dummy-coded variables).

Data Analysis Method

We used structural equation modeling with listwise deletion in MPlus 5.21 (Muthén & Muthén, 2009) to test the hypothesized relationships. We conducted the

analysis in five steps. First, we randomly split the sample to create a calibration sub-sample and validation sub-sample samples. Second, in line with Anderson and Gerbing's (1988) recommendations, we formulated the latent variables of work-family conflict, family-work conflict, psychological distress, and workplace injuries constructs with two items, two items, four items, and two item parcels (i.e., the mean count of the first four injury types in the index representing one parcel, the mean count of the remaining five injury types in the index representing the other parcel), respectively, to establish a satisfactory measurement model . Third, we extended our evaluation of the measurement model in the calibration sample to incorporate a test for monosource bias described by Podsakoff, MacKenzie, Lee, and Podsakoff (2003). Specifically, we estimated a measurement model that allowed a latent variable representing a single source to affect each of the manifest indicators. To enable model identification, this monosource variable was orthogonal to the other four latent variables.

Fourth, after establishing the measurement model fit, we assessed the full latent-variable structural model. We tested three nested versions of the latent variable structural model (Kelloway, 1998). We first estimated the hypothesized fully-mediated model (Figure 1). We then estimated a model in which psychological distress partially mediated the relationship between work-family conflict and workplace injuries and family-work conflict and workplace injuries. This partially mediated model incorporated all of the relationships depicted in Figure 1 and added direct paths from work-family conflict and family-work conflict to workplace injuries. Finally, we modeled a non-mediated model, in which direct paths from work-family conflict and workplace injuries and family-work

conflict and workplace injuries were estimated but the path from psychological distress and workplace injuries was omitted.

With the fully-mediated and non-mediated models nested within the partially-mediated model, model comparison is possible using the χ^2 difference test and, as a set, enables assessment of both the necessity and sufficiency of these relationships for demonstrating mediation (Kelloway, 1998). In addition, we calculated several model fit indices (i.e., Comparative Fit Index [CFI]; Root Mean Square Error of Approximation [RMSEA]; Standardized Root Mean Square Residual [SRMR]), using benchmarks suggested by Hu and Bentler (1998, 1999) as a guideline for assessing model fit.

Fifth, for purposes of cross-validation, we attempted to replicate the best-fitting model from the calibration sample with the validation sample. We first tested the comparative configural model in which no parameter constraints were specified (i.e., a model combining the calibration and validation samples), and then established a model that sets the factor loadings, observed variable intercepts, and pathways as equivalent between the calibration and validation samples (Byrne, 2012). We constrained each specified causal path to equal across the calibration and validation samples, assessing the goodness-of-fit of the constrained model. These findings would argue for the statistical equivalence of the model structure across the calibration and validation samples, and then we bootstrapped any resulting indirect effects.

Results

Table 1 presents the descriptive statistics, zero-order correlations, and reliability coefficients of the study variables in the calibration (below the diagonal) and validation sample (above the diagonal).

The measurement model, including the monosource variable, using the calibration sample provided a strong fit to the data, χ^2 (27, N = 179) = 43.49, $p < .05$; CFI = .99; RMSEA = .04, SRMR = .03, with the standardized parameter estimates appearing in Table 2. This model, however, did not provide a better fit to the data than did the model without the monosource effects, $\Delta\chi^2$ (2, N = 304) = 1.26, ns. As such, all subsequent tests of the model using this sample did not incorporate the monosource variable.

The proposed mediation model presented in Figure 1 provided an adequate fit to the data, χ^2 (85, N = 179) = 176.59, $p < .001$; CFI = .93; RMSEA = .08, SRMR = .05. However, including the direct prediction of workplace injuries by work-family conflict and family-work conflict (i.e., partially-mediated model) resulted in a better fitting model, $\Delta\chi^2$ (2, N = 179) = 59.88, $p < .001$. The non-mediation model, which deleted the path from psychological distress to workplace injuries, provided a worse fit to the data, $\Delta\chi^2$ (1, N = 179) = 9.84, $p < .01$, than the partially-mediated model.

Model comparisons suggest the partially-mediated model provides the best fit to the data. Psychological distress was predicted by work-family conflict ($\beta = .65$, $p < .001$) but not family-work conflict ($\beta = .01$, ns), in support of H1a but not H1b. Workplace injuries were predicted by psychological distress ($\beta = .24$, $p < .01$) and work-family conflict ($\beta = .57$, $p < .001$) but not family-work conflict ($\beta = .11$, ns). Taken together, these results show that psychological distress partially mediates the relationship between work-family conflict and workplace injuries (in support of H1a and in partial support of H2a), but that family-work conflict is not related to psychological distress (rejecting H1b) or related to workplace injuries through psychological distress (rejecting H2b).

In comparing the models on the calibration and validation samples, we found that the data fit the unconstrained model [χ^2 (166, N = 370) = 230.26, $p < .001$; CFI = .98; RMSEA = .05, SRMR = .03] and equality-constrained model [χ^2 (205, N = 370) = 281.32, $p < .001$; CFI = .97; RMSEA = .05, SRMR = .04] well and with similar strength. A statistically non-significant $\Delta\chi^2$ (39, N = 370) = 51.06, ns, indicated strong measurement and structural invariance between the two samples.

Finally, to augment this evidence, we bootstrapped the model using the validation sample, producing a bias-corrected confidence interval for the standardized parameter estimate for the indirect effect (Preacher & Hayes, 2004; Shrout & Bolger, 2002). Results showed that the standardized indirect effect of work-family conflict on workplace injuries was .15 ($p < .05$, 95% confidence interval: .02-.26), supporting the mediation hypothesis. The percentage of the indirect effect relative to the total effect (.72, 95% confidence interval: .59-.86) was approximately 21%.

In these data, the relationship between work-family conflict (not family-work conflict) and workplace injuries was mediated by psychological distress. From a methodological perspective, however, cross-sectional tests of processes that unfold over time can produce substantially biased estimates of parameters even under full mediation conditions (Maxwell & Cole, 2007). Thus, an advantage of a second study would be to replicate the model and extend it on a number of methodological fronts. First, in Study 2, we used items from validated measures of work-family conflict and family-work conflict scales. Second, we test the model with employees beyond healthcare context (i.e., manufacturing/service contexts). Third, we mitigate the risk of threats of common

method inflation by separating when the exogenous and endogenous variables are collected (Podsakoff et al., 2003).

Study 2

Method

Procedure and Sample

We collected data for this study using Study Response, an online participant recruiting system operated by Syracuse University that has a database of over 100,000 individuals who have previously agreed to be contacted to participate in research surveys. A pre-screening survey was distributed to identify only those individuals who were (1) currently employed in a manufacturing or service position and (2) interested in completing our survey. A total of 349 people responded to the pre-screening survey, 252 of whom met the above criteria. A six-month lag occurred between the two survey administrations (T1 = time 1, T2 = time 2), allowing us to link individual responses between the two time points. Of the 252 who received the T1 survey, 147 responded; further, 128 of these same participants responded at T2 (51% overall response rate).

The final sample (77 women and 49 men; 2 did not report gender), had an average age of 43.69 years (SD = 10.53 years; range: 22-68 years). Participants also reported a median of one dependent living at home (range: 0-6) and 38% were single.

Measures

Work-family conflict. Three highest-loading items from Netenmeyer, Boles, and McMurrian's (1996) work-family conflict scale were used in this study at T1. Response options ranged from 1 (strongly disagree) to 7 (strongly agree), with higher scores corresponding to higher levels of work-family conflict. Sample items included: "The

demands of my work interfere with my home and family life" and "The amount of time my job takes up makes it difficult to fulfill family responsibilities."

Family-work conflict. This variable was measured by the extent to which family interferes with work obligations used in this study at T1 (Netemeyer et al., 1996). Response options ranged from 1 (strongly disagree) to 7 (strongly agree), with higher scores corresponding to higher levels of family-work conflict. Sample items include "The demands of my family or spouse/partner interfered with work-related activities" and "I had to put off doing things at work because of demands on my time at home."

Psychological distress. The four items from the General Health Questionnaire (Goldberg, 1978) used in Study 1 were also used in this study at T2.

Workplace injuries. The workplace injury measure (Hemingway & Smith, 1999) used in Study 1 was retained for this study and administered at both T1 and T2. The index consists of commonly experienced injuries in manufacturing, service, and healthcare contexts.

Demographic control variables. We controlled for age (in years), gender (1 = male; 2 = female), number of dependents living at home, and marital status (1 = single, 2 = partnered).

Data Analysis Method

We modelled the relationships between work-family conflict and family-work conflict as exogenous variables (both measured at T1), and psychological distress and workplace injuries as endogenous variables (both measured at T2), controlling for prior levels of workplace injuries (measured at T1) and control variables (i.e., age, gender,

number of dependents living at home, and marital status) using structural equation modelling in MPlus 5.21 (Muthén & Muthén, 2009).

With the exception of all the single-item control variables and the workplace injuries indices, we operationalized all constructs as latent variables based on their respective items to first confirm evidence of the measurement model. Like in Study 1, we operationalized the workplace injury index at both time points by creating two item parcels, with the mean of the frequency of the first four types of injuries in the index as one parcel, and the mean of the frequency of the remaining five types of injuries in the second parcel. In addition, we tested whether incorporation of monosource bias provided a better fit to the data.

From a research design perspective, temporal separation of the exogenous and endogenous variables with a period of six months helps to reduce monomethod bias from participants remembering previously-completed items (Podsakoff et al., 2003). Statistically, we allowed measurement error across time on the workplace injuries indices to correlate, reducing possible impact of administering the workplace injuries indices twice, and the reduction of third variable effects by controlling for the baseline level of workplace injuries (Zapf, Dormann, & Frese, 1996).

As with Study 1, we modelled a set of plausible structural models (i.e., hypothesized full mediation, partially-mediated model, and non-mediated model), enabling nested comparisons of the fully-mediated model with the partially-mediated model, and the partially-mediated model with the non-mediated model. Finally, we bootstrapped the best-fitting model to estimate a confidence interval over which any indirect relationships occur.

Results

Table 3 presents the means, standard deviations, and interrcorrelations for Study 2 variables. The proposed measurement model including the monosource latent variable provided an acceptable fit to the data, χ^2 (67, N = 128) = 181.80, $p < .01$; CFI = .92; RMSEA = .08, SRMR = .05, providing a better fit than the measurement model that omitted the monosource latent variable, $\Delta\chi^2$ (7, N = 128) = 22.84, $p < .01$. As such, all subsequent structural model tests retained the monosource latent variable. In addition, we used Goodman and Blum's (1996) recommendations for assessing the effects of non-random sampling from participant attrition. Specifically, we conducted a logistic regression with a dichotomous endogenous variable distinguishing participants who responded only at Time 1 from those who responded at both Times 1 and 2 on all of the study variables and control variables, finding that data were missing at random. This mitigated concerns about the effects of systematic attrition on the model.

The fully-mediated model provided satisfactory fit to the data, χ^2 (105, N = 128) = 236.96, $p < .01$; CFI = .91; RMSEA = .09, SRMR = .05. Adding the direct predictions of work-family conflict and family-work conflict to workplace injuries (i.e., the partially-mediated model) did not result in a better model fit, $\Delta\chi^2$ (2, N = 128) = 1.28, ns. Finally, removing the pathway from psychological distress to workplace injuries, resulted in a worse fit to the data than the partially-mediated model, $\Delta\chi^2$ (1, N = 128) = 10.83, $p < .01$.

Of the three models, this set of tests suggests that the fully-mediated model provides the best fit to the data. Workplace injuries were predicted by psychological distress ($\beta = .37$, $p < .001$). Psychological distress was predicted by both work-family

conflict ($\beta = .24$, $p < .05$) and family-work conflict ($\beta = .24$, $p < .05$) in support of H1a and H1b.

We bootstrapped the indirect relationships between work-family conflict and workplace injuries and family-work conflict and workplace injuries. Results showed that the standardized indirect effect of work-family conflict on workplace injuries was .09 ($p < .05$; 95% confidence interval: .01-.18), supporting H2a. In contrast, the standardized indirect effect (.08) of family-work conflict on workplace injuries was not statistically significant, with zero falling within the 95% confidence interval (-.01-.19), failing to support H2b.

General Discussion

In this paper, we draw on Conservation of Resources (COR) theory (Hobfoll, 1989, 2001) to investigate why work-family interference might generate a workplace hazard for employees. The findings from both studies in this paper suggest that work-family conflict in particular may represent a hazard because it generates psychological distress in those experiencing such inter-role conflict, and psychological distress in turn may result in higher workplace injuries. Although previous research on work-family interference has documented the negative effects on employee health outcomes, there have been no prior attention paid to workplace injuries, and similarly little attention paid to the potential mechanisms by which work-family interference and health outcomes may occur. Using one cross-sectional and one panel sample spanning a range of occupational contexts, we found evidence that psychological distress mediates the relationship between work-family conflict and workplace injuries. Family-work conflict, in contrast, did not exert the same effects as work-family conflict on workplace injuries.

This research is important for several reasons. First, while there is limited research on the relationship between role stressors and workplace injuries, to our knowledge, this is the first empirical study to examine the relationship between work-family conflict and workplace injuries. Though Cullen and Hammer (2007) demonstrated the relationship between work-family conflict and safety compliance and safety participation, this study extends their research by linking work-family interference directly with workplace injuries. Second, this paper used Conservation of Resources theory (Hobfoll, 1989; 2001) to explain why psychological distress mediates the relationship between work-family conflict and workplace injuries. The current findings suggest that higher levels of work-family conflict are associated with more workplace injuries and provide insight into one psychological state that explains this relationship. Work-family conflict taxes the mental resources of employees, who are trying to conserve functioning in two important life domains, creating higher levels of psychological distress, which is associated with more workplace injuries. This pattern of findings was robust across two different samples, even after controlling for demographics related to work-family interference and psychological distress, as well as prior levels of workplace injuries.

The present findings are theoretically and practically important because they further recognize the safety benefits to both organizations and employees of helping employees to balance work and family demands. From a theoretical perspective, our findings support COR theory and suggest that work-family interference may threaten resources, which in turn relates to employee psychological distress. Importantly, psychological distress can then affect workplace injuries. These findings further suggest

that spillover between work and family domains can threaten workplace outcomes. This finding is surprising given that research (e.g., Frone, Russell, & Cooper, 1992) has argued that family-work conflict is more likely to affect work outcomes than work-family conflict. This is not to say that family-work interference has no effects on psychological distress and workplace injuries. The bivariate relationships between family-work and both psychological distress and workplace injuries were statistically significant in both samples in this paper. However, in competition with each other in the same structural model, work-family conflict seems to present the stronger psychological stressor to individuals. This is perhaps not as surprising when one considers that the family domain is arguably more salient than the work domain for most individuals. Future research could test this explanation directly by examining the importance of each domain as a moderator in the work-family interference to psychological distress relationship.

From a practical perspective, our results suggest that organizations might reduce workplace injuries if they support programs that allow employees to better meet family demands. Although research on the effectiveness of these programs is mixed (Kelly et al., 2008), examples of such programs might include on-site daycare facilities, flexible time arrangements, and personal days that employees can take off work when an unexpected family demands arises (e.g., sick kids). In addition, organizations can introduce lower-cost supports that have demonstrated effectiveness. For instance, Bakker, Demerouti, and Euwema (2005) found that providing employees with autonomy and feedback, and ensuring a high-quality relationship between supervisors and subordinates, buffered the effects of work-family conflict on employee exhaustion. Such programs may help take

the pressure of work interference with family off of employees, reducing psychological distress and helping them to focus on work when at work.

Following Cullen and Hammer's (2007) comprehensive model, future research would also benefit from exploring how the fuller range of work-to-family and family-to-work constructs (e.g., strain-based, behavior-based, energy-based) are related to workplace safety outcomes. The model could be expanded to suggest more enriching and dynamic relationships between work-family balance and/or work-family enhancement (Clark, 2007; Rothbard, 2001) and these outcomes by investigating via diary studies how the more momentary changes in these competing demands may be associated with fluctuations in safety outcomes.

Workplace safety is clearly important for the well-being of employees; however, in some contexts, the psychological distress resulting from work-family interference might present a danger to others. For example, in the healthcare context, work-family interference might reduce attention to patients resulting in harmful errors in treatment. Though our data does not address this question directly, the findings suggests that work-family interference might pose a danger not only to oneself, but in contexts where work involves the care of others, it may also present a risk of harm to others. Future research should examine this question by investigating medical error rates as the dependent variable. The implication is that efforts by organizations to ensure that employees have adequate resources to support both work and family demands are critical for the individual, the organization, and other potential stakeholders.

Study Limitations and Strengths

This study possesses a number of limitations and strengths that should be noted. In terms of limitations, the nature of the study designs precludes causal inference. Although we replicated the pattern of results across two studies, none provided experimental control to establish causality. A repeated-measures design over a longer period with a control group (e.g., a change in work schedule that reduces work-family conflict in one group of employees, but not in another) would provide a test of causality. Second, these data are based on employee self-reports, making them vulnerable to possible inflation of the observed relationships. However, in both studies we tested for common method-variance. In Study 1, the common method factor was non-significant, and in Study 2, we controlled for the common-method factor. These tests assuage concerns about common method variance. Third, while collecting self-report data on work-family conflict and psychological distress makes sense, there are methodological benefits to collecting other-source data on workplace injuries. However, research has found problems with other-report injuries. For example, employees may choose not to report or under-report workplace injuries (Collinson, 1999; Gray, 2002; Probst, Brubaker, & Barsotti, 2008), when injuries are relatively minor, or because employees feel embarrassed to report injuries that may typify work in a particular occupation or profession. Prior research (e.g., Andersen & Mikkelson, 2008; Landen & Hendricks, 1995) has suggested that short-term self-report indexes of workplace injuries can serve as reliable and valid measures.

In terms of strengths, the present set of studies demonstrates the robustness of findings across three samples (the calibration and validation sub-samples in Study 1, and the two-wave sample in Study 2). Second, we replicated our findings using different

measures of work-family and family-work interference. Third, Study 2 used a two-wave design controlling for injuries at Time 1.

Conclusions

In this study, we provided evidence for the relationship between work-family conflict, psychological distress, and workplace injuries. More generally, the enormous human costs associated with workplace injuries combined with the large organizational costs associated with workers compensation, lost work-time, and demoralized workers suggest that it is both the moral and practical imperative of organizations to minimize the psychosocial risk factors of workplace injuries. Helping employees manage how work exerts an effect on family is one way this can be achieved.

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Footnote

[1] Coefficient alpha is not meaningful as these items are formative indicators of an overall injury index rather than reflective indicators of a latent construct (Frone, 1998).

Table 1

Study 1: Means, Standard Deviations, Reliabilities, and Intercorrelations Among Study Variables in Calibration (N = 193-323) and Validation Samples (N = 205-322)

	Variable	1.	2.	3.	4.	5.	6.	7.	M (V)	SD (V)	α (V)
1.	Gender	--	-.06	.15*	-.19**	-.15**	.10	.01	.19	.40	--
2.	Age (in years)	-.04	--	-.41**	.17**	.16**	-.02	.10	44.08	10.18	--
3.	Number of dependents	.09	-.39**	--	-.31**	-.19**	.10	-.18**	1.42	1.01	--
4.	Work-family conflict	.01	-.14*	.19**	--	.44**	.41**	.18**	3.36	1.20	.89
5.	Family-work conflict	-.03	-.15**	.27**	.54**	--	.22**	.02	4.19	.80	.80
6.	Psychological distress	.01	-.14*	.15*	.52**	.29**	--	.14*	1.09	.67	.85
7.	Workplace injuries[1]	-.04	.01	.06	.14*	.12*	.14*	--	1.17	.34	--
	M (C)	.20	43.39	1.39	3.40	4.28	1.11	1.20			
	SD (C)	.40	10.98	1.04	1.21	.85	.73	.29			
	α (C)	--	--	--	.88	.79	.88	--			

Note. * p < .05. ** p < .01. C = calibration sample. V = validation sample. Calibration sample below the diagonal with descriptive statistics below each column; validation sample above the diagonal with descriptive statistics at the end of each row. The dummy variables representing the eight occupational groups are not included here for clarity of presentation, but are included in the structural analyses. Gender: 1 = male, 0 = female.

Table 2

Study 1: Standardized Parameter Estimates for the Measurement Model Including Monosource Bias Effects in the Calibration Sample

Indicator	Latent Variables				
	Work-family conflict	Family-work conflict	Psychological distress	Workplace injuries	Common method
1. Work-family conflict item 1	.87				.21
2. Work-family conflict item 2	.87				.25
3. Family-work conflict item 1		.80			.35
4. Family-work conflict item 2		.69			.35
5. Psychological distress item 1			.70		.37
6. Psychological distress item 2			.73		.36
7. Psychological distress item 3			.69		.41
8. Psychological distress item 4			.70		.37
9. Workplace injury parcel 1				.94	.18
10. Workplace injury parcel 2				.85	.18

Note. Empty cells are non-estimated parameters.

Table 3

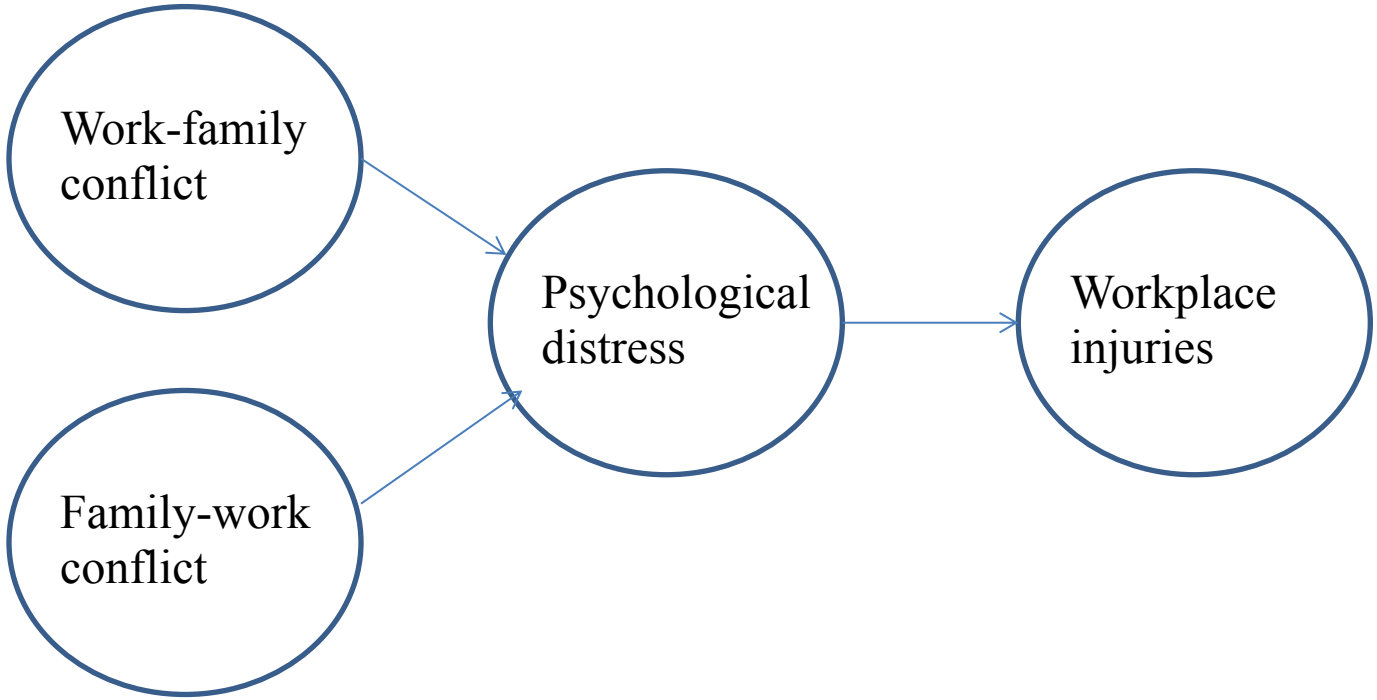
Study 2: Means, Standard Deviations, Reliabilities, and Intercorrelations Among Study Variables (N = 128-147)

	Variable	1.	2.	3.	4.	5.	6.	7.	8.
1.	Gender								
2.	Age (in years)	-.11							
3.	Marital status	-.18*	.07						
4.	Number of dependents	-.10	.05	.37**					
5.	Work-family conflict (T1)	-.06	.08	.23**	.11				
6.	Family-work conflict (T1)	-.21*	.14	.25**	.31**	.54**			
7.	Psychological distress (T2)	-.09	.21*	.14	.06	.47**	.47**		
8.	Workplace injuries[1] (T2)	-.27**	.20*	.06	.12	.32**	.43**	.53**	
	M	1.61	43.57	1.62	1.03	3.33	2.41	2.01	1.43
	SD	.49	10.39	.49	1.33	1.76	1.55	.88	.58
	α	--	--	--	--	.94	.92	.91	--

Note. * $p < .05$. ** $p < .01$. Gender: 1 = female; 2 = male. Marital status: 1=single; 2 = partnered. T1 = time 1. T2 = time 2.

Figure Caption

Hypothesized Model


Work-family conflict
Family-work conflict
Psychological distress
Workplace injuries